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OF THE
SCIENCE OF ELECTROPLATING

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SPECIAL NOTICE

Dear Mr. Secretary:

Greetings: from this Office, and to inform you that in accordance with the last Convention instructions, that the Supreme Secretary send a letter to all Manufacturers of Plated articles employing Platers and they be urged to send a representative to our Convention at Milwaukee, June 1, 2, 3, 1924, it necessary that you send me a list of the names of firms in your district not later than April 15th, that I may prepare and obtain required amount of letters to be written and mailed. So do this at earliest opportunity for assistance of this Office.

The Convention Committee also implores you to send in your papers or the names of men who guarantee papers at once, as the time is getting short before compiling the program and printing, so Let's Go.

With Best Wishes to you all from the Supreme Officers, I am

Very truly,
F. J. HANLON,
Secretary.

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EDITORIAL

THE TRUTH AND THE DOGMA IN THE ELECTROPLATING INDUSTRY

By Joseph Hass, Jr., Read at Chicago Banquet

It had been my intention when I was requested to write a paper for this evening to choose a practical subject, but the experiments carried on lead to indefinite conclusions, so that instead of writing a practical paper, all I am able to present to you this evening is but a general paper on:

"The Truth and the Dogma in the Electroplating Industry."

Men, who use their minds may be divided into two great classes—the seekers of the truth and the defenders of the dogma. Electroplating, like religion, has its truth-seekers and its dogmatists. Within recent years, from time to time, notable examples of both groups have been revealed through the various journals pertaining to electroplating. The industry has too small an amount of the former, and by far too large an amount of the latter.

The "all practical men" are the industry's dogmatists, contending wordly for the theories and practices with which their thinking has so long been woven, that they fear in their hearts to lose them. Electroplating has, however, its open-minded seekers of the truth, to whom no dogma is so precious as the freedom to think honestly. It is the dogma defenders who are perpetuating the obstacles to progress in the electroplating industry and who are perplexing the younger men. It is the truth-seekers who are trying to combat down these obstacles and opposition to real pro-

gress. Progress is not in mere words, but in action. to proclaim in "knowledge is strength" or "we are united for the dissemination of knowledge" means nothing, unless knowledge is truly disseminated. To impart knowledge to a few selected friends is not dissemination of knowledge.

It seems that it is possible for only truth-seekers to meet together in true comradeship and without restraint relate their experiences and difficulties, receiving advice and encouragement. In the end they find that they are nearer in thought and experience than they had thought possible.

No experience can be more stimulating than to follow a truth-seeker, as he pushes through an underbrush of tradition and prejudice; no experience can be more helpful, more revealing, more truly educational. It is a fine discipline for the mind. This cannot be more fitly illustrated than recalling the case of Percy S. Brown, who many years ago advocated the use of single nickel salts and purer anodes in nickel plating. An army of dogmatists surrounded him, endeavoring to tear apart his reasoning, but only the passage of a few years was required to bring about his vindication.

The average mind in the plating room needs disciplining, in the sense that it needs to be taught to think, and to understand what it reads. Companionship with those who have learned to use that tool that we call the "brain"—who have learned to use it honestly, will disclose how little real thinking is done by those engaged in the plating industry, and how much of what they attempt is handicapped by their likes and dislikes; their feelings, their inherited systems of belief, their accepted formulae, and their own self interest. To realize this fact is the first step in freeing the mind, and until the resolve is taken to achieve this freedom the full joy and the reward of clear thinking is denied.

One of the most striking differences that one discovers between the truth-seeker and the defender of dogma is in the attitude of each toward the use of words and data. And the discovery arouses one to a sense of how dangerous words and data may become if they are not used correctly. With the dogma defender the temptation is strong to make his case, or to barricade his position. Words and data are built into his wall, or twisted into his defense, merely to

make a defense which he feels is unapproachable. Too often he is better pleased with the skill he has shown in wall building, and the dexterity he has manifested in weaving, than he is concerned for the position he is trying to defend or the substantial nature of the barrier he has erected. In the end he runs the risk of betrayal by the very words and data he has misused.

Another striking difference between the truth-seeker and the dogma defender is in the attitude each has toward his work and his fellow workers. The dogmatist lives in the past; his important arguments are "as it was 30 or 40 years ago" or "we have always done it that way." Discrediting the work of others is chiefly the work of the dogmatist; he does nothing progressive himself, but sits back on his success that no one knows of but himself. He has no words of encouragement to give or assistance to offer. To guard the position he has created for himself the dogmatist is on the alert for the slightest sign of a movement that might disturb him in his serene position. Then his thunder flies regardless of fact or data. Much of the difference of opinion in electroplating is due to the conflict which arises from battling over these barricades.

Another discovery that is made in following the truth-seeker is the need of humility, as well as honesty of mind. There is so much that we do not know. There is so much that the wisest do not know. Intellectual pride is the chief sin against "Truth." Dogmatism is neither justified by the so-called practical man nor by the chemist-electroplater. Science, owing all its mighty achievements to the "Mind," stands baffled before the instrument it has used. It thinks but it cannot explain thinking. It admits its limitations. Cannot the dogmatist in this light admit his own limitations and mistakes?

OBITUARY

It is with sincere regret that we chroncile the death of Doctor Blum's mother. The society through its official organ extends its sincere sympathy to Doctor Blum and family.

ADDRESS OF WELCOME

By F. J. Hanlon, Pres. Chicago Branch A. E. S.

Chicago, January 25th, 1924.

Gentlemen: As President of the Chicago Branch of the American Electroplaters' Society it accords me extreme pleasure to extend to you members, visiting members and guests and the Supreme Officers, a cordial greeting and a hearty welcome to this our 12th annual banquet on behalf of Chicago Branch.

The custom of holding this annual event has become an established one in our entire society because of the opportunities afforded the attendants of these affairs to enjoy the spirit of good fellowship and to renew acquaintances of the previous banquets and to discuss and review the trade topics of the past year, to listen to able and talented lecturers on electroplating and speakers who do things of a material benefit to the plating industry, for which the American Electroplaters' Society is noted, and the results of which are of great value to the members of our profession and the manufacturers of plated products the world over.

The idea of trade societies is not new, but the American Electroplaters' Society is "unique" in the annals of both ancient and modern history on the formation of these societies; first, because of its membership, foreman platers, meaning no matter just what the present employment of some of our members, and I can assure you there are many occupying the thrones of sales executives, managers, superintendents and owners of large institutions. They were once platers, and each with an ambition to become learned in his profession, seekers of the power of education, an ideal that can never be surpassed, no matter what amount of wealth we may amass in this world.

It is the power that creates in man the ability to do things and the knowledge, result of this power is a far greater asset to the human race than wealth in our present-day commercial pursuits and has left its imprint in the pages of Progress of the Plating Industry.

We are also UNIQUE because we have no secrets, we publish a monthly REVIEW, covering every phase of the plating industry and its branches, which comes to the at-

tention of our members either in their success or failure and we discuss and debate these findings at our meetings, impartially and without prejudice or levity, to a better understanding of our profession by our members. We hold annual conventions where three to five hundred men and women from all parts of the United States and Canada travel many miles each year to listen to the most eminent speakers and lecturers on electro-chemistry and the finishing of materials from the different universities, Bureau of Standards at Washington, D. C., and our membership. And do any of our visitors seek the usual recreation of these events. No, we are UNIQUE and seekers of education; we spend twelve to fifteen hours each day discussing and listening to debates on our profession to be of assistance to the progress of our industry and to be a part of it if possible.

I therefore say now to you gentlemen, who are qualified to become members of this great society, not to let the opportunity pass lightly or you may feel that in another decade you have lost another chance to have been better for having lived and when the grim reaper swings his sythe you can feel assured that you were a part of the wheat of life and not the chaff.

In conclusion, gentlemen, I wish to thank you all for your attention and especially the banquet committee for the efficient manner in which they have managed this annual event, and all the members who have so ably assisted me in the discharge of my official duties, and who have responded so cheerfully in all of our activities to the success of the entire American Electroplaters' Society, and this, my friends, is to me co-operation, UNIQUE, and its beauties and reward can be naught but Success, and I feel that the most excellent two formulas for foreman electroplaters in 1924 are to attend our convention at Milwaukee in June, get more education and a membership in the American Electroplaters' Society.

Ques. No. 1—Why is carbonate of soda added to a copper solution?

Ans. No. 1—To help increase the conductivity of the solution.

Ques. No. 2—What is a good stop off for use in preventing deposit in silver plating?

Ans. 2—Asphalt dissolved in turpentine with small addition of Koppell varnish was recommended. CHICAGO QUESTION BOX.

PITTING OF NICKEL PLATING

By Oliver P. Watts at Annual Banquet Chicago Branch, A. E. S.

January 25th, 1924.

"Passing the buck" is nowadays one of the most popular of indoor sports. All of us are ready to take full credit for our successes, but some of us want to shift the responsibility for our failures to other shoulders than our own. When about six weeks ago I was asked to speak tonight on the pitting of nickel plating, I had to confess that in my very limited experience with nickeling I had never had a case of pitting. "Lucky man," some of you will say; yet not so lucky for one who is to address a meeting of experienced platers on this subject! Naturally I demurred, but was assured that my complete inexperience was no bar to my speaking to you on this subject. What do you make out of that, coming from the chairman of your program committee?

As I had on various occasions already told you all that I **know** about plating, and many things that I only gussed at, it seemed to be a question of this subject or none at all. So, with the assurance of assistance from members of Chicago Branch, I accepted. Although I have used in experimenting all the time that I could beg, borrow or steal, I am still unable to give you a cure for pitting, and so stand before you like a school boy without his lesson, trying to shift the blame off on your program committee. You are in for a disappointing quarter of an hour. Put the blame where you think it belongs.

At the outset I wish to say that for the facts concerning pitting and for most of the samples exhibited, I am indebted to Messrs. F. J. Hanlon, F. C. Mesle, C. C. Martel, C. F. Nixon and O. E. Servis, without whose prompt and cordial co-operation it would have been impossible for me to speak on this subject at all.

Although pitting of nickel plate is of comparatively rare occurrence, considering the enormous amount of nickeling that is done, I am told that it is one of the most troublesome ailments in nickel plating. In attempting to find its cause the first thing is to learn with what other metals besides nickel pitting occurs. I have received only three replies on this point, too few to make my conclusions final, but they

indicate that pitting has been found with nickel, iron, lead and cyanide copper solutions, while it is reported that pitting has never occurred with brass, silver and copper. Note that there is a conflict regarding copper. This will be referred to later.

During the war I encountered a bad case of pitting of lead plating, which was presented to you at the banquet in January and printed in the MONTHLY REVIEW for April, 1919. Hundreds of boosters were covered with pits like those shown in the picture here. The cause was traced to air, dissolved in the solution when it stood idle over night, and expelled when the solution became heated by the heavy current used in plating. Preheating the cold solution with steam stopped the trouble. Inspection of pitted nickel plate shows that this also is caused by the clinging of bubbles of gas to the metal surface during plating, but it has generally been thought that in this case the gas is hydrogen.

My first experiments were undertaken to determine whether the gas that causes pits in nickeling is air or hydrogen. Since the amount of gas is too small to be connected and tested readily, an indirect method was employed. A nickel solution, consisting of single sulphate, ammonium chloride and boric acid, was cooled nearly to the freezing point of water, and air blown through it for 15 minutes or more. An acid copper sulphate solution was treated similarly, both solutions were connected in series electrocally, and electrolyzed for 1 to 3 hours, while they were heating on a radiator or in a hot room. Pitting occurred in the nickel solution, but never in the copper solution. Had air been responsible for pitting this should have occurred in both solutions. If it were due to hydrogen pitting should occur just as found, only on the nickel; for at a reasonable current density hydrogen cannot be liberated from a strong solution of copper sulphate. Pitting also took place with this nickel solution without the cooling and heating. Other nickel solutions were made which did not give pitting under any conditions.

There are only two reasons that occur to me why air did not cause pitting in the copper solution, as it did in lead plating. The heating of the copper solution was from the outside, not evenly throughout the whole electrolyte by the

current as with the lead solution, and the deposition of metal was much less rapid, so that air bubbles were not so promptly anchored in place by the building up of metal around them. Air bubbles were seen to collect on the sides of the glass jar in both the copper and nickel solutions, and some appeared on the cathodes, but did not stick to the copper long enough to cause pits.

It seems safe to conclude that hydrogen is the immediate physical cause of the pitting of nickel deposits as ordinarily met with. Pitting of any metal deposit by air bubbles may occur under such unusual conditions as caused it in the lead plating.

What causes the hydrogen bubbles? Here are the causes as given by two of those who were so kind as to write their experiences with pitting:

(a) The solution is too acid.
(b) It is too alkaline.
(c) The current density is too high.
(d) Imperfections on the surface of the metal.

Two members mentioned specific instances where starting a tank with new anodes caused pitting that persisted for several days. This is probably due to a skin on the anodes which resists corrosion, and the lessened efficiency at the anode produces acid which causes hydrogen to be deposited slowly. Slight grinding of the surfaces of the anodes before putting them in the tank should help to prevent this trouble.

Remedies

Certain precautions are obvious, such as keeping up the nickel content, keeping the acidity low, and avoiding too high a current density. Although the average current density may be low enough to avoid pitting on most of the object that is being plated, the unequal distribution of current that almost invariably occurs may give too high a current density on corners or edges, and so cause pitting at these places only. It is undoubtedly because of unequal distribution of current that the nickeling on some articles is pitted, while other objects beside them receive a perfect plate.

Imperfections in the surface of the article have been strongly emphasized by one member as a cause of pitting.

While this is probably not often a primary cause of pitting, causing pitting to occur from a solution that would not give pits if all objects in the tank had smooth surfaces, it may often determine where pitting will take place. Edges and corners always receive a higher current density than adjoining flat surfaces, and this will be true to some degree for microscopic scratches and pits on the surface of the metal. The location of gas pits along the edges of indentations is illustrated by the left-hand booster in the picture of pitting in lead plating, which has been passed around.

It is easy to see how a pit develops, once a bubble is formed and clings to the surface of the metal. Deposition beneath it is prevented, so a ring of metal is built up around the bubble, which tends to hold it from being dislodged, and so long as it can maintain its foothold it will absorb other bubbles that touch or bump against it. It is thus that the deep burrows were formed in the sample of electrolytic iron which I have in my hand. During deposition this was removed and rinsed under a faucet a half dozen times, but the bubbles of gas persisted through all this treatment. Once a deep pit is started you know how nearly impossible it would be to bridge over it by electro-deposition. Evidently the way to stop pits is to prevent their getting started.

One member states that pitting has repeatedly been cured by addition of epsom salts.

Since the pitting of nickel plate is usually due to hydrogen it might be assumed that the more hydrogen evolved the worse the pitting. This does not follow. In order to produce a pit the gas bubble must cling in one spot long enough for the metal deposit to build up around it to an appreciable degree. There is, therefore, little likelihood of pitting when there is a steady evolution of gas during plating, as in the brass and cyanide copper solutions. It is the slow evolution of gas, requiring 15 to 30 minutes for a bubble to form, that is dangerous. Even in the brass and cyanide copper solution, where normally a steady stream of hydrogen is evolved, there is a possibility that in deep cavities where the current density is very low deposition of hydrogen may be slow enough to cause pitting, provided the bubbles clinging there are not dislodged by gas rising from other portions of the object. The greater the amount

of free cyanide present and the higher the current density the more rapid will be the evolution of hydrogen and the less the probability of pitting. It must be due to some difference in operating conditions that one of your members reports pitting in a hot cyanide copper solution, while I have used such a solution for occasional plating for several years without a single pit. My plating has been done at a high current density, 30 to 50 amperes per square foot, and on objects without deep cavities.

It would seem that one way to stop pitting in a nickel solution is to keep it acid enough to insure a steady evolution of hydrogen. While this will stop pitting, except possibly on portions of the surface where the current density is abnormally low, such as hollows, it would make the deposit so brittle that peeling would be likely to occur, and the remedy might be worse than the disease.

Two of my attempts to stop the deposition of hydrogen may be of interest to you, although neither proved to be practical. The first was to add to the nickel solution a depolarizer for hydrogen, that would oxidize this completely. Sodium nitrate was tried. It had the expected effect of removing every trace of hydrogen and there was no pitting; but it nearly stopped the deposition of nickel also, causing the efficiency of nickel deposition to drop from 93 to 0.5 per cent. The trouble is that the intrate not only exodizes the hydrogen that normally deposits, but invites a lot more hydrogen to plate out and be oxidized, so that nearly all the current is spent in depositing hydrogen instead ofnickel.

The other attempted remedy was the addition of a salt of a metal on which hydrogen is deposited with much greater difficulty than on nickel, that is a metal having a high overvoltage or discharge potential for hydrogen. The discharge potential of hydrogen is highest on mercury, so a small amount of mercuric chloride was added. It slightly lessened the deposition of hydrogen, but did not stop it. With the failure of these two medicines, both of which seemed promising from the electrochemical point of view, the only remedy at present seems to be that previously recommended, viz.: to keep the metal content up to full strength, the acidity low, and the current density low and uniform on all objects and their different parts.

DO EMPLOYERS REALIZE THE VALUE OFTHE A. E. S.?

Read by E. J. Musick, St. Louis Banquet

In answer to this question I can safely state that 90 per cent. do not. In other words, just one out of every ten employers who maintain plating departments actually realize the value of our society. Many have heard of our organization and what our purpose is; somehave attended banquets and other gatherings, but few have realized to what extent the American Electroplaters' Society has been, is now and will in the future be of direct benefit to them.

Mr. Employer, do you realize that the A. E. S. is different from practically every other society or organization with which you as a business man have come in contact? Do you know that it is a society organized for strictly educational purposes, to educate your foreman plater, to produce a better grade of plating on your product, and also to do it at a great saving in cost to you?

Do you know that the A. E. S. has local branches in 24 cities in the United States and Canada, and has a membership of over 1,000 members?

The membership is divided into three classes—active, associate and honorary members. Active members are those who have been actively engaged in electroplating for at least five years, during one of which he must have acted as a foreman plater. Associate members are those who are graduate chemists or electro-chemists, or those who have been actively engaged in electro-chemical engineering for a period of three years; also the representative of supply houses dealing directly in electroplating supplies. It is necessary that a supply house representative qualify as an active member to be eligible. Associate members cannot hold any office other than a member of the board of managers. Honorary members are those whose knowledge or services would be or have been pre-eminently valuable to the society.

We have found it to be to the mutual advantage and general welfare of the foreman plater and his employer to have the associate members with us at our meetings, as it very often presents some interesting and thorough discussion of the characteristics of a product from different

angles. We have always found the associate member very reluctant to mention anything about his products unless directly requested for information regarding it, but on the other hand he has always been willing to enter into an unbiased discussion on any subject; in fact, Mr. Employer, I have often wished that you were present at some of our meetings when we have had exceptionally fine discussions. I Ifeel sure that you wold not only have been surprised at the plating knowledge being disseminated, but you would have wished that there were a society of fellow employers who had no selfish motives, but who would meet regularly and discuss your problems and help one another as we do. Our meetings are open to anyone interested and all are welcome.

Mr. Employers, you no doubt realize how easy it is for a man who is doing the same kind of work each day to get into a rut, how easy it is to become satisfied with things as they are, how old customs and habits cause one to do things the same old way and accept them as facts and rules. Before the A. E. S. was formed no class of men were more like this than foreman platers, but now these men have been awakened and a broad vision of possibilities have loomed up before them. Most of them have been instilled with an enthusiasm and a desire that cannot be satisfied unless something worth while is accomplished.

Mr. Employers, your foreman plater does not expect you to know of everything he may accomplish of direct benefit to you but he does want to know that he is at least gradually improving himself to be a better foreman. He would like you to know more about the A. E. S. since its prestige and good work has been recognized by no less an authority than the Bureau of Standards, Washington, D. C.

On November 16th and 17th, 1923, the research advisory committee of the A. E. S. met in joint conference with the Electroplating committee of the Bureau of Standards at Washington, D. C. and held most interesting and instructive sessions on research work covering,

Principles of Acidity and Throwing Power.

Throwing power of nickel solutions.

Nickel Anode investigations.

Protecting value of nickel plating.

Nickel plating on zinc; and other miscellaneous subjects.

There were present, three members representing the A. E. S., nine members of the Bureau of Standards and at least a dozen technical representatives of the leading manufacturers of the country.

These two days were absorbed with discussions and the next sessions will probably be of longer duration. It has been suggested that this committee be made larger and the best man available in each branch be sent to the Bureau of Standard's annual sessions on nickel plating and kindred subjects. This would make a committee with wonderful possibilities and would, no doubt, with the guidance and assistance of the Bureau of Standards and other technical men, solve some of the apparently mysterious problems that are confronting the electroplater today.

Mr. Employer, the expense of sending a member of each branch to the annual research sessions at Washington would be more than most of the distant branches could afford and a movement should be started in each city to have the employers who maintain plating plants, subscribe a reasonbale amount to a fund to be used for the expenses in sending these practical foremen to the annual research sessions, as the Bureau of Standard's available fund for carrying on this work is very limited and only covers the necessities of a small amount of research work.

We trust, Mr. Employer, that you will take advantage of our invitation to attend any of our meetings and that we may have, ont only your moral support, but also your financial assistance if it becomes necessary in order that we may be able to improve our ability and your product.

BRANCH NEWS

St. Louis Branch

The eleventh annual banquet was held at the American Annex on January 19. It was an unusually cold day for St. Louis, yet the severity of the weather had little effect on the attendance. We had 72 men, former employers and their representatives, at the afternoon session, which was given over entirely to the lecture by Dr. Wm. Blum of the Bureau of Standards, Washington, D. C. Too much cannot be said regarding this lecture on the work being done at the Bureau.

Many complimentary expressions were heard from chemists, manufac-

turers and foremen platers. It was a new vision, especially to those not having heard Dr. Blum previously. Mr. G. S. Robins presided at this session. He is a pastmaster of the art of handling discussions. While this session was on the ladies were entertained at the movies. In the evening after a real dinner was served, Mr. F. Minniges, president of St. Louis Branch, was introduced as toastmaster. Mr. Menniges in a few well chosen words expressed the appreciation of St. Louis Branch to the 140 persons present for their friendship toward the A. E. S. Mr. E. J. Musick, Supreme First Vice-President, was then called on. Mr. Musick presented a very tactful paper on "Do Employers Realize the Value of the A. E. S.?" This should reach every employer and will be published.

Dr. Wm. Blum was then introduced. Dr. Blum's address was characteristic of the man, whose heart is in his work. Sincere, yet entertaining and advisory to all present.

To all who know the next speaker are aware that "You Can Never Tell" when Mr. H. J. Richards, better known as "Hedley," gets the floor, so his subject was a very fitting one. This humorous genius excelled his past reputation, and that is "going some."

One of the unexpected pleasures was to have with us Mr. E. W. Heil of Wichita, Kansas, who made this long journey for the express purpose of hearing Dr. Blum and have a part in our festivities. Ed. tried several alibis, but finally come across with a speech, expressing his pleasure at being present, and that he felt amply repaid for taking the trip.

Messrs. E. Lamoureau and F. J. Liscomb of Chicago Branch each did their "bit," as Mr. Lamoureau was the leader in the organizing of our branch, while Mr. Liscomb presided at our first official meeting.

Mr. H. H. Williams made a few remarks in closing, calling attention to our next annual convention at Milwaukee, urging all to plan for this big event.

Letters of good wishes were received from Supreme President Sterling and Supreme Secretary Hanlon.

Mr. G. S. Robins gave several humorous readings.

Dancing was indulged in until 12 o'clock.

Mr. E. J. Musick was chairman of committee having this successful affair in charge.

Having several of our out-of-town members with us at annual banquet, a special meeting was called for the Monday night following (January 21). This was held at the American Annex and was very informal. It was what the St. Louis "Germans" call a coffee claatch." All had one subject in common, and the modest man could not get a word in. Dr. H. C. Ward of Washington University met with us and explained some points. Sandwiches and coffee were served at the close.

On Tuesday, February 5, our regular meeting was held, with President F. Menniges in the chair. Dr. H. C. Ward of Washington University was elected as an honorary member of our branch.

One application for membership was received.

Report of banquet committee proved the success of the affair from all viewpoints.

It was decided to have an open meeting in April or May for the purpose of "boosting" for the Milwaukee convention.

In absence of Librarian Horath, Mr. C. T. McGinley presided over the discussions of the evening, which was a continuation of several questions from previous meetings.

Rochester Branch

Regular meetings of Rochester Branch were held at Powers Hotel January 11 and February 8, President S. P. Gartland presiding. The attendance at both meetings was very good.

Arrangements for the lecture by Dr. Blum are being made by the following committee: Geo. Hesselink, Raymond Lopez, Harry Bernard, A. Doering, S. P. Gartland and Edwin Crowley.

It is the intention of this committee to not only get our members out to hear Dr. Blum, but to invite all platers and manufacturers who might be interested in the art of electro deposition, so that they may become acquainted with the work that the A. E. S. is doing in conjunction with the Bureau of Standards.

This lecture will be given in Rochester on April 8.

Favorable action was taken on four transfers, received from Syracuse Branch, for the following members: F. C. Mesle, Martin Crean, William Throop and Charles H. Pease. We take the pleasure at this time to extend a hearty welcome to our Syracuse friends.

Meeting nights have again been changed to every second and fourth Saturday of each month, at Powers Hotel. This change was made to give our out-of-town members a chance to attend.

Pittsburgh Branch

It has been some time since I last wrote you; one reason is that our regular meeting in January was called off on account of below-zero weather. However, the boys came out last Saturday night in a goodly number and a very interesting meeting was the result.

The secretary read a letter from Dr. W. Blum, who stated that he would lecture in Pittsburgh Friday evening, March 28, 1924. Every member present at the meeting took great interest in this notice and everything is being done to work up a good attendance for that evening.

Another application is promised for our next meeting and we hope the good work will keep going on.

Indianapolis Branch

Our regular meeting was held February 9, with President Hennessey presiding. The regular routine was gone through, then Mr. McCracken of the Leedy Manufactory gave his experience in ball burnishing, explaining the different operations he put his work through, such as sand tumbling, ball burnishing and bright nickeling; also showing samples of work after each operation. As this was interesting to everybody present, it was decided to give him a rising vote of thanks. Our subject for next meeting will be "Self-sustaining Nickel Solution," offered by Mr. Wm Lamoureux.

Boston Branch

Boston Branch met Friday, the 1st, at the American House, at 8 P. M,, with President Nihan in the chair.

After the regular order of business the reports of committee were made. The chairman of the research committee made no report. The committee on the stag party made their report and stated that the stag party will be held on February 23, at the American House, at 6: 30 P. M., and it will be $2.50 a plate. This is for the members only.

Mr. Herrick was appointed to meet Dr. Blum when he arrives in Boston on Wednesday, March 5.

A discussion was held on what is the best black for filling in the background of silver-plated work, which lasted until the meeting adjourned at 10:15 P. M.

Detroit Branch

Regular meeting Detroit A. E. S. held Friday, February 1, 1924, President B. E. Miller in the chair, and a fine attendance. Minutes read and approved. Communications from S. Herrick, Dr. Blum, Chicago banquet committee; F. Powers, President J. E. Sterling. No applications for membership were received.

Research committee reported favorably and Detroit Branch has made application for affilation with the Associated Technical Societies of Detroit, which include 14 technical societies.

Detroit Branch certainly made a wise move in this respect. Banquet will be held March 22.

Dr. Blum will give his lecture on nickel research at Cass Technical High Auditorium on Friday, March 14.

We extend a vote of thanks to Mr. Allen, J. C. Moore and the Board of Education for this favor.

Detroit Branch will hold its next meeting, if possible, at the above Society Club rooms, at 478 Alexandrine avenue West. T. C. Eichstaedt and R. L. Shepard were elected delegates to that society.

There was a lengthy discussion on the questionaire Detroit A. E. S. is circulating.

Research committee will draw up a series of subjects for papers and discussions, one for each month.

Toronto Branch

A goodly number of Toronto members and their friends attended the January 28th meeting, to hear one of the best features of our winter series of lectures. The speaker, Mr. Lenard S. Bryson, chief Inspector Canada Cycle and Motor Co., presented a line of information which was quite different from general run of our visitors. His subject "Ordinary Metals" included brass, tobin bronz, grey iron, malleable iron, various steel alloys and aluminium. We venture to say that ninty per cent of those present entered into the discussions or presented questions. Mr. Bryson proved himself competent to handle the situation in a very masterly manner and held his audience to attention for two hours, even John Young remaining to hear the last sentence, and that is going some. The

lecture was splendidly illustrated by many specimens of the various metals in different stages of the treatments necessary to produce the finished product. A hearty vote of thanks was extended Mr. Bryson for his truly instructive talk, and he was requested to come again.

Preparations for the coming of Dr. William Blum, of the U. S. Bureau of Standards, Washington, D. C., on Wednsday, April 9th, are already under way, and if we are capable of judging, we can foresee a rousing reception for the Dr. when he comes to Toronto. If publicity means success in such matters, it is sure to be a record breaker.

On February 25th, we will devote the entire evening to questions and answers and discussions relating to papers which have been received from our out-of-town members. Then in March, we will continue our series of lectures if all is well.

We would earnestly request any of the U. S. members, who may visit Toronto, on or about the date of our monthly meetings, to meet with us. Really we seldom see a member from Uncle Sam's domain. Who will be the first?

Philadelphia Branch

Philadelphia Branch met Friday, February 1st, U. of P. with President Gehling in the chair, and a good attendance.

One applicant was elected to membership.

Messrs Scott and Rathbone of this branch attended the meeting of the American Standards Committee in New York on January 29th.

The committee adapted means to have a national uniform specification on all galvanizing, sherardizing and electroplating of zinc coated commodities.

The meeting had representatives from all technical associations representing the manufacturers and dealers of all commodities, also different government departments were represented.

This meeting did not deal on standardizing solutions or method of applying zinc to articles. Their object was to overcome the poor coating on all products, howver, by compelling the producer to live up to specifications set down by them for indoor and outdoor requirements.

All zinc coated work was criticised for its poor endurance and chipping. The government has refused to buy any zinc coated sheets until better protection is assured.

Zincked iron sheets were well knocked for chipping as well as metal laths, condulets, nails and miscellaneous fabricated products.

You can see what this conference means to the electroplaters in complying with specifications. Not to pile more zinc on work or to plate longer, or anything else that would add to the expense to the present operation, but to apply to the art of electroplating the science it deserves.

Librarian Scott read a paper on the deposition of brass, which brought forth some interesting opinion and results.

New York Branch

The first meeting of the year, January 11th was attended well by the members and after the regular order of business was gone into and

conducted by Pres. Morningstar in the Chair, and the minutes of the previous meeting were read and approved and the application of a prospective member was voted to take its usual course. A very lively discussion was ntered into by the members in respect to the seemingly improbable ability of those connected with the silver plating end of the industry to get uniform deposits of equal thickness on all points of the article plated. Some members were of the opinion that a fair degree of accuracy in deposit was attained in shops where standardized solution and equipment was maintained, but others cited there experience on work with which they had got varying results with what they thought proper procedure. The presenting of a piece of brass work that was nickel plated in a solution that had been left standing in several alcohol barrels for some days showed a deposit of a streaky brightness and an exaggerated condition of pitting, which some of the members present attributed to an excess of glue from the barrels, which was absorbed by the solution and different remedies were proposed to correct the condition.

A communication from Dr. Blum of the Bureau of Standards relative to a proposed talk to members in New York vicinity was received and the branch voted that their annual affair would be a good time to hear him and accordingly invited him to address them on that day.

The meeting adjourned at the call of the Chair at 11:30.

Hartford—Connecticut Valley Branch

Hartford—Connecticut Valley Branch met on Monday, January 28th, with President Vibberts presiding, and nine members present.

Plans were discussed for the opening meeting on March 4, at which Dr. Blum will speak and Mr. H. R. MacFadyen was appointed a committee of one to supervise the arrangements.

Mr. Hogaboom invited members of this Branch to attend a meeting of the American Electro-Chemical Society in New Britain on Saturday, March 15th, at which Dr. Colin Fink will speak on "Electro-Chemistry."

The following questions were in the box:

1—How can a good color be maintained in a gold solution that is seldom used. Answer—Keep free cyanide low and avoid the use of other ingredients than gold and cyanide.

2—What is the best method of recovering gold from an old solution? Answer—Precipitate with zinc shavings.

3—How cold can a nickel solution be run and still get a good deposit? Answer—This would depend upon the solution itself. Double salt solutions do not work well under 60°F., while single salt solutions containing a chloride may be run as low as 40°F.

Milwaukee Branch

At our last meeing, the principal topic was about the approaching conventions and the various committees were called on to make their reports.

The committee on educational program has been at work 3 months, they have sent out over 60 invitations to individuals, and to all of the branch secretaries, while they have had quite a lot of correspondence, they report they have not received a single paper up to February 1st.

While it is still early, they have confidence that they will begin to get favorable results in the near future, the earnestly request all branch secretaries to take up this matter at every meeting. The various committees on entertainment and outings have made good progress and have had a very favorable report. The committee on advertising in program and those in charge of the booths, have all of the preliminary work done, and the work of soliciting will begin at once. The alcove on the mezzanine floor has been set aside for the exhibits of plating and finishes by the members, the Supreme society will give prizes for the best awards.

The lecture of Dr. William Blum was the leading educational event of the season, the name of Doctor Blum on a program is sufficient to insure a packed house, the board of managers sent out 150 invitations and report an attendance of 130, the small hall in the vocational training school was packed to capacity, and those that missed this treat will have many regrets.

The convention boosters all attended the Chicago Banquet and all had a very good time, the committee in charge of the educational program for the convention were very busy trying to induce the leading lights to promise to have papers or talks for the cenvention, and they got some encouraging promises.

Cleveland Branch

Below please find the report of our last meeting, January 26, 1924.

The regular January meeting of the Cleveland Branch of the American Electroplaters Society was held on the above date at 8 P. M., by Pres. Ter Doest. This meeting was a very interesting one in spite of the bad weather. Those that did not attend sure missed something.

Mr. Martin Horwath was elected to membership.

We expect to have Dr. Blum with us March 27, to give us a talk on nickle solution and oun regular March meeting will be changed to that date.

After the regular order of business, the balance of the evening was spent in a general discussion which proved to be very interesting. Adjournment was called for at 10 P. M.

Waterbury Branch

Arrangements have been practically completed for the lecture of Dr. W. Blum, under the auspices of Waterbury Branch, on the evening of Monday, March 3d. The lecture will take place at Chase Auditorium, the subject being, "Researches in Nickel Deposition". A general invitation has been extended to all electroplaters, superintendants and manufacturers, who are interested in electroplating, and also electrotypers. An interesting discussion took place at the last meeting of the Branch, the subject being "some brass articles which upon being polished and ickeled, and afterwards colored with rouge, would upon being run across the coloring wheel or even bent, blister or peel, and leave underneath another coating of nickel." The operator was positive that same was not caused by a break in the current or poor cleaning. The solution was

made up of double and single nickel salts, boric acid and sal-ammoniac. By the addition of boric acid, the work stopped peeling and could be bent with no effect on the nickel plate. The information on desired was: 1st—Why does this peling appear? 2nd—What is the effect of the added boric acid? 3d—If the fault is in the solution, why do not all the articles peel?

Newark Branch

The Newark Branch held a get-together supper at the De Jeannis Restaurant, 17 Central avenue, Newark, N. J.

This supper was one of the most successful and well attended suppers ever held by the Newark Branch. Supper was served at 7:30 P. M., during which a musical program was rendered by Mr. J. Grier and accompanied by Mr. P. Wahlen at the piano.

Mr. Charles Proctor, founder of the A. E. S., was present and gave his usual very interesting and instructive talk on chromium plating.

Our librarian, Mr. E. W. Faint, gave a very interesting description of the laboratory class research work on plating pure sheet aluminum, and then in his usual masterly style introduced the speaker of the evening, the Rev. E. W. Powell of Roselle Park, N. J., whose subject was "What an Interesting World We Live In."

Dr. Powell's talk, though not of a plating nature, opens up new avenues of thought and talk straight from the shoulder; convincing talk, one that grips and sinks beneath the surface of all those present.

Newark Branch boasts of having one of the best banquet committee chairmen in the A. E. S. today, Mr. Horace H. Smith. Mr. Smith has charge of the evening affairs and from past experiences, this banquet will be the best ever held. A large attendance is expected, exceeding that of last year, when 316 dinners were served. A wonderful time and the most enjoyable evening you ever spent.

The afternoon session will be in charge of our librarians, Mr. Faint, Mr. Ankson and Mr. Wm. De Vote.

The advertising and publicity end is in very capable hands—Mr. Oliver Sizelove and Mr. Peter Kollbe.

The ticket committee comprises the following: Mr. Roy Stout, Mr. Philip Seveny and Mr. Royal Clark.

The laboratory class is working out a surprise for the afternoon session,

So Watch Our Smoke!
Newark Knows How!

Chicago Branch

Chicago Branch held its regular meeting February 9th, with president Hanlon in the chair. An invitation from the New York Branch to their banquet was read and we expect to be represented, we also received one application and elected one applicant to membrship.

Th banquet committee made their final report which proved that the last banquet was the most successful one Chicago Branch ever held and in view of the outcome, the branch is planning to hold a smoker in the

near future, one like we used to have in the past. The president appointed the following committee to look after the arrangements: O. E. Servis, chairman; N. P. Hunter and William G. Meggers.

ELECTED TO MEMBERSHIP

Pittsburgh Branch

Louis C. Gerth, Active .....2915 Breker St., Pittsburgh, Pa.

Philadelphia Branch

Otto E. Peterson, Associate ..Grays Ferry and 33rd St., Philadelphia, Pa.
Samuel F. Lumbeck, Active .....3304 Washintgon St., Wilmington, Del.

Newark Branch

Peter Koelble, Associate .....1079 Salem, Ave., Hillside, N. J.
George Conley, Active .....14 Wormblewem Ave., Belleville, N. J.
Emile Ruppart, Active .....15th St., Kenilworth, N. J.

Detroit Branch

Percy Joseph Crozier, Active ....15 Oak St., Grosse Point Farms, Detroit
Frithiof Steuhagen, Associate ;
c|o C. B. Sheppard, Hart, & Charlevoix, Detroit, Mich.

Cleveland Branch

Martin Horwath, Active .....9225 Sophia Ave., Cleveland, Ohio

Chicago Branch

Charles H. Brenton, Active .....Burlington, Wis.

APPLICATIONS FOR MEMBERSHIP

Toronto Branch

Martin H. Robinson, Active .....343 Gladstone Ave., Toronto, Canada.

Pittsburgh Branch

Ervan L. Keyes .....943 N. Lincoln Ave., N. S. Pittsburgh, Pa.

Newark Branch

Frank Henry .....94 W. Canal St., Newark, N. J.

Toronto Branch

Arthur W. T. Lawrence..577 Simcoe St., North, Oshawa, Ontario, Canada

Newark Branch

August P. Muning, Associate

St. Louis Branch

A. Riefling, Active .....3924 Winnebago Ave., St. Louis, Mo.

Chicago Branch

George Hirsh, Active .....1527 N. Hamlin Ave., Chicago, Ill.

REINSTATED

Detroit Branch

Charles F. Metzger .....6045 Epworth Blvd., Detroit, Mich.

RESIGNATIONS

Henry Baumeister .....Newark Branch

BOSTON

Regular meetings are held first Friday of each month, at 8 p. m., at the American House, Boston. Secretary, A. W. Garrett, 821 Dorchester Ave., Dorchester, Mass.

BRIDGEPORT

Meets first and third Friday of each month in its laboratory, 260 John St., Bridgeport, Conn. Secretary, David Fleming, 97 Roosevelt St., Bridgeport, Conn.

CHICAGO

Meets second Saturday of each month, at 8 p. m., at the Hardware Club of Chicago, Room 1125. Secretary, R. J. Hazucha, 5128 Warwick Ave., Chicago, Ill.

CINCINNATI

Meets every Thursday, 7:30 p. m., at Vocational Training School, Spring and Liberty St. Secretary, W. J. Husing, 729 McMakin Ave., Cincinnati, Ohio.

CLEVELAND

Meets last Saturday of each month at Hotel Winton. Secretary, H. S. Kneeland, 3924 Clybourne Ave., Cleveland, Ohio.

HARTFORD-CONN. VALLEY

Meets on the fourth Monday of each month at 747 Main St., Hartford, Conn. Secretary, Tennant Elwin, 14 Fredrick St., Hartford, Conn.

DAYTON

Meets first Saturday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Wm. Hohman, 123 N. Webster St., Dayton, Ohio.

DETROIT

Meets first Friday of each month at the Old Colony Club, 2nd floor, Hotel Tuller. Secretary, E. W. Woodmansee, 1427 Lee Place, Detroit, Mich.

GRAND RAPIDS

Meets on the second Wednesday of each month at the Vocational High School, 129 Bostwick Ave., N.E. Secretary, Chas. S. Whalley, 931 Pine Ave., N.W., Grand Rapids, Mich.

INDIANAPOLIS

Meets the second Saturday of each month at Hotel Denison. Secretary, Louis Mertz, 1725 Union St., Indianapolis, Ind.

MILWAUKEE

Meets second and fourth Thursdays of each month at Lipps Hall, 321 3d St. Secretary, R. Steuernagel, 1508 Concordia Ave.. Milwaukee, Wis.

MONTREAL

Meets every Friday at 84 Craig St. West. Secretary, John H. Feelay, 411 Aylmer St., Quebec, Canada.

NEWARK

Meets first and third Fridays of each month at No. 17 Central Ave., Newark, N. J. at 8 p. m. Secretary, George Reuter, 55 Revere Ave., Hilton, N. J.

NEW YORK

Meets second and fourth Fridays of each month at the Broadway Central Hotel Parlors, New York City. Secretary, John E. Sterling, 468 Grand Ave., Long Island City, N. Y.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, P. Uhl, 2432 North 29th St., Philadelphia, Pa.

PITTSBURGH

Meets first Saturday of each month at 8 p. m., at United States Bureau of Mines Bldg., Forbes St. Secretary, S. E. Hedden, 227 Fifth St., Aspinwall, Pa.

PROVIDENCE-ATTLEBORO

Meets first and third Thursday of each month at 184 Washington St., Room 308, Providence, R. I. Secretary, Robert Crook, 185 County St., Attleboro, Mass.

READING

Meets on the second Tuesday of each month. Secretary, William M. Fisher, 654 Gordon St., Reading Pa.

ROCHESTER

Meets every second and fourth Saturday of each month at the Powers Hotel, Albert H. Doering, Secretary, 49 Cutler St., Rochester, N. Y.

SYRACUSE

Secretary, M. J. Crean, 109 Court St., Syracuse, N. Y.

ST. LOUIS

Meets first Tuesday of each month at Barr Branch Library, corner Jefferson and Lafayette Sts. Secretary, H. H. Williams, 4156 Botanical Ave., St. Louis, Mo.

TOLEDA

Meets first Thursday of each month at Toledo University Science Building, Electro-Platers' Room, corner Cherry and Page Sts. Secretary, W. W. Weiker, 411 3d St., Toledo, Ohio.

TORONTO

Meets fourth Monday of each month at Canadian Foresters' Hall, 22 College St., Room No. 2. Walter L. Barrows, 628 Dover Court Road, Toronto, Ontario, Canada.

WATERBURY

Meets every second and fourth Friday of each month. Secretary, Wm. F. Guilford, 230 Cooks St., Waterbury, Conn.